

**Claims**

1. An authoring method for use in creating an audiovisual product, comprising the steps of:

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defining a plurality of components, the components implicitly representing functional sections of audiovisual content with respect to one or more raw content objects, and a plurality of transitions that represent movements  
10 between the plurality of components;

expanding the plurality of components and the plurality of transitions to provide a set of explicitly realised AV assets (set of scrolling image data) and an expanded intermediate data structure of nodes and links  
15 (links to the set of scrolling image data and to images of each scrolling set - that is the video sequences within each set showing the scrolling), where each node is associated with an AV asset of the set and the links represent movement from one node to another; and

20 creating an audiovisual product in a predetermined output format, using the AV assets and the expanded intermediate data structure of the nodes and the links, wherein the audiovisual product comprises data to produce scrolling image data.

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2. The method of claim 1, wherein the defining step comprises defining at least one information component that comprises a reference to a raw content object.

30 3. The method of claim 2, wherein the reference denotes a file path to a location where the raw content object is stored.

4. The method of any preceding claim, wherein the defining step comprises defining at least one choice component comprising a reference to at least one raw content object, and at least one authoring parameter.

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5. The method of claim 4, wherein the at least one authoring parameter is adapted to control a selection or modification of the at least one raw content object.

10 6. The method of claim 4 or 5, wherein the at least one authoring parameter comprises a runtime variable available during playback of the audiovisual product.

7. The method of claim 4, 5 or 6, wherein the at  
15 least one authoring parameter comprises an authoring-only parameter that will not be available during playback of the audiovisual product.

8. The method of any of claims 4 to 7, wherein the  
20 choice component comprises a reference to a presentation template and a reference to at least one substitutable raw content object to be placed in the template according to the at least one authoring parameter.

25 9. The method of any preceding claim, wherein the defining step comprises defining at least one meta-component representing a set of components and transitions.

30 10. The method of claim 9, wherein the at least one meta-component is a procedurally defined representation of the set of components and transitions.

11. The method of any preceding claim, wherein each transition represents a permissible movement from one component to another component.

5 12. The method of any preceding claim, wherein each transition is associated with a triggering event.

13. The method of claim 12, wherein the triggering event is an event occurring during playback of the  
10 audiovisual product.

14. The method of claim 13, wherein the triggering event is receiving a user command, or expiry of a timer.

15 15. The method of any preceding claim, further comprising the step of checking expected conformance of the audiovisual product with the predetermined output format, using the plurality of components and the plurality of transitions.

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16. The method of claim 15, wherein the predetermined output format is a hierarchical data structure having limitations on a number of objects that may exist in the data structure at each level of the  
25 hierarchy, and the checking step comprises predicting an expected number of objects at a level and comparing the expected number with the limitations of the hierarchical data structure.

30 17. The method of claim 15 or 16, wherein the checking step comprises predicting an expected total size of the audiovisual product, and comparing the expected

total size against a storage capacity of a predetermined storage medium.

18.           The method of any preceding claim, wherein the  
5   expanding step comprises, for each component, building one  
or more of the set of explicitly realised AV assets by  
reading and manipulating the one or more raw content  
objects.

10   19.           The method of any preceding claim, wherein:

the defining step comprises defining at least one  
choice component comprising a reference to a plurality of  
raw content objects and at least one authoring parameter;  
15   and

the building step comprises:

selecting one or more raw content objects from  
20   amongst the plurality of raw content objects using the at  
least one authoring parameter; and

combining the selected raw content objects to form  
one of the AV assets.

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20.           The method of claim 19, comprising repeating the  
selecting and combining steps to automatically build a  
plurality of the explicitly realised AV assets from the  
one of the components.

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21.           The method of any preceding claim, wherein the  
expanding step comprises:

creating from each one of the plurality of components one or more explicitly realised AV assets to provide the set of AV assets;

creating the expanded intermediate data structure  
5 wherein each node represents one AV asset of the set; and  
creating a set of links between the nodes.

22. The method of any preceding claim, wherein each transition is associated between first and second  
10 components, and creating the set of links comprises evaluating each transition to create one or more links, each of the links being between a node created from the first component and a node created from the second component.

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23. The method of any preceding claim, wherein the expanding step comprises evaluating at least one of the transitions to create exit logic associated with at least one first node, evaluating one of the components to create  
20 entry logic associated with at least one second node, and providing a link between the first and second nodes according to the entry logic and the exit logic.

24. The method of claim 23, wherein at least one of  
25 the transitions is associated with a triggering event, and the expanding step comprises evaluating the triggering event to determine the exit logic associated with the at least first one node.

30 25. The method of any preceding claim, further comprising the step of checking expected conformance of the audiovisual product with the predetermined output

format, using the AV assets and the expanded intermediate data structure of nodes and links.

26.       The method of claim 25, wherein the  
5   predetermined output format is a hierarchical data structure having limitations on a number of objects that may exist in the data structure at each level of the hierarchy, and the checking step comprises predicting an expected number of objects at a level and comparing the  
10   expected number with the limitations of the hierarchical data structure.

27.       The method of claim 26, wherein the checking step comprises predicting an expected total size of the  
15   audiovisual product, and comparing the expected total size against a storage capacity of a predetermined storage medium.

28.       The method of any preceding claim, wherein the  
20   AV assets have a data format specified according to the predetermined output format.

29.       The method of any preceding claim, wherein the AV assets each have a data format according to the  
25   predetermined output format, whilst the raw content objects are not limited to a data format of the predetermined output format.

30.       The method of any preceding claim, wherein the  
30   predetermined output format is a DVD-video specification.

31. The method of any preceding claim, wherein the AV assets each comprise a video object, zero or more audio objects, and zero or more sub-picture objects.

5 32. The method of any preceding claim, wherein the AV assets each comprise at least one video object, zero to eight audio objects, and zero to thirty-two sub-picture objects, according to the DVD-video specification.

10 33. The method of any preceding claim, wherein the creating step comprises creating objects in a hierarchical data structure defined by the predetermined output format with objects at levels of the data structure, according to the intermediate data structure of nodes and links, and  
15 where the objects in the hierarchical data structure include objects derived from the explicitly realised AV assets.

34. The method of any preceding claim, wherein the  
20 predetermined output format is a DVD-video specification and the creating step comprises creating DVD-video structure locations from the nodes of the expanded intermediate data structure, placing the explicitly realised AV assets at the created structure locations, and  
25 substituting the links of the expanded intermediate data structure with explicit references to the DVD-video structure locations.

35. An authoring method for use in creating a DVD-  
30 video product, comprising the steps of:

creating a plurality of components representing parameterised sections of audiovisual content, and a

plurality of transitions representing movements between components;

expanding the plurality of components and the  
5 plurality of transitions to provide a set of AV assets and an expanded data structure of nodes and links, where each node is associated with an AV asset of the set and the links represent movement from one node to another; and

creating a DVD-video format data structure from the  
10 AV assets, using the nodes and links, wherein the DVD-video format data structure comprises data arranged to produce scrolling image data.

36. The method of claim 35 or 36, comprising  
15 creating at least one information component comprising a reference to an item of AV content.

37. The method of claim 35, comprising creating at least one choice component comprising a reference to at least one item of AV content, and at least one parameter  
20 for modifying the item of AV content.

38. The method of claim 37, wherein the choice component comprises a reference to a presentation template  
25 and a reference to at least one item of substitutable content to be placed in the template according to the at least one parameter.

39. The method of claim 37 or 38, wherein the choice  
30 component comprises at least one runtime variable available during playback of an audiovisual product in a DVD player, and at least one authoring parameter not available during playback.



40. The method of any of claims 35 to 39, comprising creating at least one meta-component representing a set of components and transitions.

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41. The method of any of claims 35 to 40, wherein each transition represents a permissible movement from one component to another component, each transition being associated with a triggering event.

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42. The method of claim 41, wherein a triggering event includes receiving a user command, or expiry of a timer.

15 43. The method of any of claims 35 to 42, wherein the expanding step comprises:

creating from each one of the plurality of components one or more AV assets to provide the set of AV assets;

20 creating the expanded data structure wherein each node represents one AV asset of the set; and

creating a set of links between the nodes.

44. The method of claim 37 or any claim dependent thereon, wherein the expanding step comprises evaluating  
25 each choice component to create a plurality of AV assets according to each value of the at least one parameter.

45. The method of claim 44, wherein evaluating each choice component comprises creating entry logic associated  
30 with at least one node and/or evaluating at least one transition to create exit logic associated with at least one node, and providing a link between a pair of nodes according to the entry logic and the exit logic.

46. The method of any of claims 35 to 45, comprising the step of checking expected conformance with the DVD-video format using the created components and transitions.

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47. The method of any of claims 35 to 40, comprising the step of checking expected conformance with the DVD-video format using the set of AV assets and the expanded data structure of nodes and links.

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48. An authoring method for use in creating an audiovisual product according to a DVD-video specification, comprising the steps of:

generating a set of AV assets each comprising a video  
15 object, zero or more audio objects and zero or more sub-picture objects, and an expanded data structure of nodes and links, where each node is associated with one AV asset of the set and the links represent navigational movement from one node to another; and

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creating a DVD-video format data structure from the set of AV assets, using the nodes and links;

the method characterised by the steps of:

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creating a plurality of components and a plurality of transitions, where a component implicitly defines a plurality of AV assets by referring to a presentation template and to items of raw content substitutable in the  
30 presentation template, and the plurality of transitions represent navigational movements between components; and

expanding the plurality of components and the plurality of transitions to generate the set of AV assets and the expanded data structure of nodes and links, wherein the set of AV assets and the expanded data structure comprises data for producing, or at least  
5 emulating, scrolling image data.

49. A method as claimed in any preceding claim comprising the step of:

10 producing, from data representing a static visual asset, a set of visual assets in which each visual asset of the set comprises data unique to that asset and data common to that asset and at least one other visual asset of the set; each visual asset of the set having respective  
15 defined dimensions.50. A method as claimed in claim 49, in which the step of producing the set of visual assets comprises the step of:

progressively traversing the static visual assets to copy data, from the static visual asset, to form  
20 respective visual assets of the set.

51. A method as claimed in claim 50 in which the step of traversing comprises the step of:

defining a predeterminable step size, less than at least one of the respective defined dimensions, and  
25 traversing the static visual asset according to that predeterminable step size.52. A method as claimed in any of claim 49 to 51, further comprising the steps of:

creating, for each visual asset in the set, associated asset display control data comprising data  
30 representing at least one selectable graphical element

and at least one link, associated with the selectable graphical element, to another visual asset of the set of visual assets.

- 5 53. A data processing method as claimed in claim 52, in which the step of creating comprises the step of:

creating, for selected or all visual assets of the set of visual assets, associated asset display control data comprising data representing at least a pair of selectable  
10 graphical elements and data representing at least a pair of links, associated with respective ones of the pair of selectable graphical elements, to a preceding visual asset and a succeeding visual asset of the set of visual assets.

- 15 54. A method as claimed in any of claims 49 to 53 in which at least one of the dimensions of the static visual asset exceeds at least one of the defined dimensions of at least one of the visual assets of the set of visual assets.

- 20 55. A method as claimed in claim 54, in which the dimensions of the static visual asset exceed two defined dimensions of at least one of the visual assets of the set of visual assets.

56. A method as claimed in any of claims 49 to 55 in  
25 which the step of producing the set of visual assets comprises the step of:

progressively traversing, in at least two different directions, the static visual asset to copy data, from the static visual asset, to form respective  
30 visual assets of the set.

57. A data processing method as claimed in any claim 56 in which the step of producing the set of visual assets comprises the step of:

5 progressively traversing, in at least two orthogonal directions, the static visual asset to copy data, from the static visual asset, to form respective visual assets of the set.

58. A data processing system for authoring optical medium data comprising:

10 means for producing, from data representing a static visual asset, a set of visual assets in which each visual asset of the set comprises data unique to that asset and data common to that asset and at least one other visual asset of the set; each visual asset of the set  
15 having respective defined dimensions.

59. A data processing system as claimed in claim 58 in which the means for producing the set of visual assets comprises means for progressively traversing the static visual asset to copy data, from the static visual asset,  
20 to form respective visual assets of the set.

60. A data processing system as claimed in claim 59 in which the means for traversing comprises means for defining a predeterminable step size, less than at least one of the respective defined dimensions, and traversing  
25 the static visual asset according to that predeterminable step size.

61. A data processing system as claimed in any of claims 58 to 60, further comprising

means for creating, for each visual asset in the set, associated asset display control data comprising data representing at least one selectable graphical element and at least one link, associated with the selectable  
5 graphical element, to another visual asset of the set of visual assets.

62. A data processing system as claimed in claim 61 in which the means for creating comprises:

means for creating, for selected or all visual assets  
10 of the set of visual assets, associated asset display control data comprising data representing at least a pair of selectable graphical elements and data representing at least a pair of links, associated with respective ones of the pair of selectable graphical elements, to a preceding  
15 visual asset and a succeeding visual asset of the set of visual assets.

63. A data processing system as claimed in any of claims 58 to 62 in which at least one of the dimensions of the static visual asset exceeds at least one of the  
20 defined dimensions of at least one of the visual assets of the set of visual assets.

64. A data processing system as claimed in claim 63 in which the dimensions of the static visual asset exceed two defined dimensions of the visual assets of the set of  
25 visual assets.

65. A data processing system as claimed in any of claims 58 to 64 in which the means for producing the set of visual assets comprises means for progressively traversing, in at least two different directions, the

static visual asset to copy data, from the static visual asset, to form respective visual assets of the set.

66. A data processing system as claimed in claim 65 in which the means for producing the set of visual assets  
5 comprises means for progressively traversing, in at least two orthogonal directions, the static visual asset to copy data, from the static visual asset, to form respective visual assets of the set.

67. A computer program comprising code for  
10 implementing a method or system as claimed in any preceding claim.

68. A computer program product comprising a computer readable medium storing a computer program as claimed in claim 67.

15 69. A method of manufacturing a DVD product; the method comprising the step creating a data carrier comprising data representing at least the set of visual assets created using a method, system, computer program or computer program product as claimed in any preceding  
20 claim. 70. A method of manufacturing a DVD product; the method comprising the steps of: reading a data carrier comprising data representing at least the set of visual assets created using a method or a system as claimed in any of claims 1 to 18; and materially producing the DVD  
25 product using the data stored on the data carrier.

71. A DVD product comprising data representing a set of visual assets; the visual assets having been derived from a static visual asset such that at least a pair of  
30 successive visual assets of the set of visual assets

comprise respective unique data and data common to the pair of successive visual assets thereby allowing a scrolling effect to be emulated when the pair of assets are successively displayed.

5 72. A data processing method substantially as described herein with reference to and/or as illustrated in the accompanying drawings.

73. A data processing system substantially as described herein with reference to and/or as illustrated  
10 in the accompany drawings.

74. A computer program product or element substantially as described herein with reference to and/or as illustrated in the accompanying drawings.

75. A method of manufacturing an optical data  
15 product substantially as described herein with reference to and/or as illustrated in the accompanying drawings.

76. An optical product or DVD product substantially as described herein with reference to and/or as illustrated in the accompanying drawings.

20 77. A medium storing computer executable instructions for performing the method of any of claims 1 to 57.

78. A medium storing an audiovisual product or  
25 associated data authored according to the method of any of claims 1 to 57.